What is claimed is:

1. A composition comprising decellularized bone marrow extracellular matrix, wherein the bone marrow extracellular matrix has been produced *in vivo* in an animal.

2. The composition of claim 1, wherein the animal is a mammal.

3. The composition of claim 2, wherein the mammal is selected from the group consisting of cow, pig, horse, chicken, cat, dog, rat, monkey, and human.

4. The composition of claim 3, wherein the human is an adult, adolescent, neonate or fetus.

5. The composition of claim 1, wherein the bone marrow extracellular matrix is arranged in a structure and wherein the structure is maintained after the bone marrow extracellular matrix is decellularized.

6. The composition of claim 1 further comprising a biological material.

7. The composition of claim 6, wherein the biological material is selected from the group consisting of erythropoietin, stem cell factor (SCF), vascular endothelial growth factor (VEGF), transforming growth factor (TGF), fibroblast growth factor (FGF), epidermal growth factor (EGF), cartilage growth factor (CGF), nerve growth factor (NGF), keratinocyte growth factor (KGF), skeletal growth factor (SGF), osteoblast-derived growth factor (BDGF), hepatocyte growth factor (HGF), insulin-like growth factor (IGF), cytokine growth factor (CGF), stem cell factor (SCF), platelet-derived growth factor (PDGF), endothelial cell growth supplement (ECGS), colony stimulating factor (CSF), growth differentiation factor (GDF), integrin modulating factor (IMF), calmodulin (CaM), thymidine kinase (TK), tumor necrosis factor (TNF), growth hormone (GH), bone morphogenic proteins (BMP), matrix metalloproteinase (MMP), tissue inhibitor matrix metalloproteinase (TIMP), interferon, interleukins, cytokines, integrin, collagen, elastin, fibrillins, fibronectin, laminin, glycosaminoglycans, vitronectin, proteoglycans, transferrin, cytotactin, tenascin, and lymphokines.

8. A method for treating a defective, diseased, damaged or ischemic tissue or organ in a subject comprising implanting the composition of claim 1 into the subject.

9. A method for treating a defective, diseased, damaged or ischemic tissue or organ in a subject comprising injecting the composition of claim 1 into the subject.

10. A method for augmenting or reconstructing a tissue or organ in a subject comprising implanting the composition of claim 1 into the subject.

11. A method for augmenting or reconstructing a tissue or organ in a subject comprising injecting the composition of claim 1 into the subject.

12. A composition comprising decellularized bone marrow extracellular matrix, wherein the bone marrow extracellular matrix has been produced *in vivo* in an animal and is arranged in a structure, wherein the structure is maintained after the bone marrow extracellular matrix is decellularized.

13. A composition comprising decellularized bone marrow extracellular matrix, wherein said decellularized bone marrow extracellular matrix is produced by a method comprising the steps of:

(a) obtaining from an animal a bone marrow sample that has been produced *in vivo* in the animal, wherein the bone marrow sample comprises an extracellular matrix and a non-extracellular matrix component;

(b) processing the bone marrow sample to remove at least some of the non-extracellular matrix component to obtain decellularized bone marrow extracellular matrix; and

(c) sterilizing the decellularized extracellular matrix.

14. The composition of claim 13, wherein the non-extracellular matrix component comprises cells, cell components, antigens, cytokines, blood, bone spicules, serum, and fat.

15. The composition of claim 13, wherein at least 50% of the non-extracellular matrix component is removed.

16. The composition of claim 13, wherein at least 80% of the non-extracellular matrix component is removed.

17. The composition of claim 13, wherein at least 95% of the non-extracellular matrix component is removed.

18. The composition of claim 13, wherein the animal is a mammal.

19. The composition of claim 18, wherein the mammal is selected from the group consisting of cow, pig, horse, chicken, cat, dog, rat, monkey, and human.

20. The composition of claim 19, wherein the human is an adult, adolescent, neonate or fetus.

21. The composition of claim 13, wherein the bone marrow extracellular matrix is arranged in a structure and wherein the structure is maintained after the bone marrow extracellular matrix is decellularized.

22. The composition of claim 13 further comprising a biological material.

23. The composition of claim 22, wherein the biological material is selected from the group consisting of erythropoietin, stem cell factor (SCF), vascular endothelial growth factor (VEGF), transforming growth factor (TGF), fibroblast growth factor (FGF), epidermal growth factor (EGF), cartilage growth factor (CGF), nerve growth factor (NGF), keratinocyte growth factor (KGF), skeletal growth factor (SGF), osteoblast-derived growth factor (BDGF), hepatocyte growth factor (HGF), insulin-like growth factor (IGF), cytokine growth factor (CGF), stem cell factor (SCF), platelet-derived growth factor (PDGF), endothelial cell growth supplement (ECGS), colony stimulating factor (CSF), growth differentiation factor (GDF), integrin modulating factor (IMF), calmodulin (CaM), thymidine kinase (TK), tumor necrosis factor (TNF), growth hormone (GH), bone morphogenic proteins (BMP), matrix metalloproteinase (MMP), tissue inhibitor matrix metalloproteinase (TIMP), interferon, interleukins, cytokines, integrin, collagen, elastin, fibrillins, fibronectin, laminin, glycosaminoglycans, hemonectin, thrombospondin, heparan sulfate, dermantan, chondrotin

sulfate (CS), hyaluronic acid (HA), vitronectin, proteoglycans, transferrin, cytotactin, tenascin, and lymphokines.

24. The composition of claim 13, wherein the method further comprises the step of enzymatically treating the decellularized bone marrow extracellular matrix.

25. The composition of claim 13, wherein the method further comprises suspending the decellularized bone marrow extracellular matrix in a saline solution.

26. A method for treating a defective, diseased, damaged or ischemic tissue or organ in a subject comprising implanting the composition of claim 13 into the subject.

27. A method for treating a defective, diseased, damaged or ischemic tissue or organ in a subject comprising injecting the composition of claim 13 into the subject.

28. A method for augmenting or reconstructing a tissue or organ in a subject comprising implanting the composition of claim 13 into the subject.

29. A method for augmenting or reconstructing a tissue or organ in a subject comprising injecting the composition of claim 13 into the subject.

30. A medical device suitable for insertion or implantation into a patient, wherein the medical device comprises a surface and a composition comprising decellularized bone marrow extracellular matrix, wherein the bone marrow extracellular matrix has been produced *in vivo* in an animal.

31. The medical device of claim 30, wherein the decellularized bone marrow extracellular matrix is coated onto the surface.

32. The medical device of claim 30, wherein the medical device is non-biodegradable.

33. The medical device of claim 30, wherein the medical device is a stent.

34. The medical device of claim 30, wherein the medical device is an artificial heart.

35. The medical device of claim 30, wherein the composition further comprises a biologically active material.

36. The medical device of claim 35, wherein the biologically active material is paclitaxel.

37. The medical device of claim 30, wherein the decellularized bone marrow extracellular matrix is produced by a method comprising the steps of:

(a) obtaining from a subject a bone marrow sample having an extracellular matrix and non-extracellular matrix component;

(b) processing the bone marrow sample to remove at least some of the non-extracellular matrix component to obtain decellularized bone marrow extracellular matrix; and

(c) sterilizing the decellularized extracellular matrix.

38. The medical device of claim 37, wherein the non-extracellular matrix component comprises cells, cell components, antigens, cytokines, blood, bone spicules, serum, and fat.

39. The medical device of claim 37, wherein at least 50% of the non-extracellular matrix component is removed.

40. The medical device of claim 37, wherein at least 80% of the non-extracellular matrix component is removed.

41. The medical device of claim 37, wherein at least 95% of the non-extracellular matrix component is removed.

42. The medical device of claim 37, wherein the animal is a mammal.

43. The medical device of claim 42, wherein the mammal is selected from the group consisting of cow, pig, horse, chicken, cat, dog, rat, monkey, and human.

44. The composition of claim 43, wherein the human is an adult, adolescent, neonate or fetus.

45. The medical device of claim 37, wherein the bone marrow extracellular matrix is arranged in a structure and wherein the structure is maintained after the bone marrow extracellular matrix is decellularized.

46. The medical device of claim 37 further comprising a biological material.

47. The medical device of claim 37, wherein the biological material is selected from the group consisting of erythropoietin, stem cell factor (SCF), vascular endothelial growth factor (VEGF), transforming growth factor (TGF), fibroblast growth factor (FGF), epidermal growth factor (EGF), cartilage growth factor (CGF), nerve growth factor (NGF), keratinocyte growth factor (KGF), skeletal growth factor (SGF), osteoblast-derived growth factor (BDGF), hepatocyte growth factor (HGF), insulin-like growth factor (IGF), cytokine growth factor (CGF), stem cell factor (SCF), platelet-derived growth factor (PDGF), endothelial cell growth supplement (ECGS), colony stimulating factor (CSF), growth differentiation factor (GDF), integrin modulating factor (IMF), calmodulin (CaM), thymidine kinase (TK), tumor necrosis factor (TNF), growth hormone (GH), bone morphogenic proteins (BMP), matrix metalloproteinase (MMP), tissue inhibitor matrix metalloproteinase (TIMP), interferon, interleukins, cytokines, integrin, collagen, elastin, fibrillins, fibronectin, laminin, glycosaminoglycans, hemonectin, thrombospondin, heparan sulfate, dermantan, chondrotin sulfate (CS), hyaluronic acid (HA), vitronectin, proteoglycans, transferrin, cytotactin, tenascin, and lymphokines.

48. The medical device of claim 37, wherein the method further comprises the step of enzymatically treating the decellularized bone marrow extracellular matrix.

49. The medical device of claim 37, wherein the method further comprises suspending the decellularized bone marrow extracellular matrix in a saline solution.

50. A biocompatible material comprising decellularized bone marrow extracellular matrix, wherein the bone marrow extracellular matrix has been produced in *vivo* in an animal.

51. The biocompatible material of claim 50, wherein the decellularized bone marrow extracellular matrix is produced by a method comprising the steps of:

(a) obtaining from a subject a bone marrow sample having an extracellular matrix and cellular components;

(b) processing the bone marrow sample to remove at least some of the non-extracellular matrix component to obtain decellularized bone marrow extracellular matrix; and

(c) sterilizing the decellularized extracellular matrix.

52. The biocompatible material of claim 51, wherein the non-extracellular matrix component comprises cells, cell components, antigens, cytokines, blood, bone spicules, serum, and fat.

53. The biocompatible material of claim 51, wherein at least 50% of the non-extracellular matrix component is removed.

54. The biocompatible material of claim 51, wherein at least 80% of the non-extracellular matrix component is removed.

55. The biocompatible material of claim 51, wherein at least 95% of the non-extracellular matrix component is removed.

56. The biocompatible material of claim 51, wherein the animal is a mammal.

57. The biocompatible material of claim 56, wherein the mammal is selected from the group consisting of cow, pig, horse, chicken, cat, dog, rat, monkey, and human.

58. The composition of claim 57, wherein the human is an adult, adolescent, neonate or fetus.

59. The biocompatible material of claim 51, wherein the bone marrow extracellular matrix is arranged in a structure and wherein the structure is maintained after the bone marrow extracellular matrix is decellularized.

60. The biocompatible material of claim 51 further comprising a biological material.

61. The biocompatible material of claim 60, wherein the biological material is selected from the group consisting of erythropoietin, stem cell factor (SCF), vascular endothelial growth factor (VEGF), transforming growth factor (TGF), fibroblast growth factor (FGF), epidermal growth factor (EGF), cartilage growth factor (CGF), nerve growth factor (NGF), keratinocyte growth factor (KGF), skeletal growth factor (SGF), osteoblast-derived growth factor (BDGF), hepatocyte growth factor (HGF), insulin-like growth factor (IGF), cytokine growth factor (CGF), stem cell factor (SCF), platelet-derived growth factor (PDGF), endothelial cell growth supplement (ECGS), colony stimulating factor (CSF), growth differentiation factor (GDF), integrin modulating factor (IMF), calmodulin (CaM), thymidine kinase (TK), tumor necrosis factor (TNF), growth hormone (GH), bone morphogenic proteins (BMP), matrix metalloproteinase (MMP), tissue inhibitor matrix metalloproteinase (TIMP), interferon, interleukins, cytokines, integrin, collagen, elastin, fibrillins, fibronectin, laminin, glycosaminoglycans, hemonectin, thrombospondin, heparan sulfate, dermantan, chondrotin sulfate (CS), hyaluronic acid (HA), vitronectin, proteoglycans, transferrin, cytotactin, tenascin, and lymphokines.

62. The biocompatible material of claim 51, wherein the method further comprises the step of enzymatically treating the decellularized bone marrow extracellular matrix.

63. The biocompatible material of claim 51, wherein the method further comprises suspending the decellularized bone marrow extracellular matrix in a saline solution.

64. The biocompatible material of claim 51, wherein the biocompatible material is in the form of a scaffold.

65. The biocompatible material of claim 51, wherein the biocompatible material is suitable for implantation into a patient.